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09/298,008	04/22/1999	JERRELL P. HEIN	75622.P0001	1575

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EXAMINER	
BRINEY III, WALTER F	

ART UNIT	PAPER NUMBER
2644	20

DATE MAILED: 09/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/298,008	HEIN ET AL.	
	Examiner	Art Unit	
	Walter F Briney III	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,10-18 and 21-23* is/are rejected.

7)☒ Claim(s) *8,9,19 and 20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

In response to the appeal brief (paper 19, filed 09 June 2004), prosecution is hereby reopened and this action is non-final.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 recites the limitation "*the linefeed control signals*" in 8 of the claim. There is insufficient antecedent basis for this limitation in the claim. For the purposes of this action, the examiner assumes that the linefeed control signals are referring to *the control signal* stated in line 6 of claim 4, the claim that claim 12 depends from.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. **Claims 1, 2, 4, 6, 13 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhou et al. (US Patent 5,878,133).**

Claim 1 is limited to *an integrated circuit package*. Zhou discloses a digital direct current feed control for a communication system (abstract; figure 1). The control is situated in a SLAC portion (12) of a telephone interface circuit (10). The SLAC itself is one integrated substrate (column 3, lines 1-13) (i.e. *an integrated circuit*). Zhou discloses that the power feed control circuit (50) includes current sense inputs from the subscriber loop (49; column 4, lines 24-39) (i.e. *having sense inputs for a sensed tip signal and a sensed ring signal of a subscriber loop*). The control circuit (50) sends a control signal (47) to the battery feed circuit (38) based on the sensed circuitry (column 5, line 64 to column 6, line 38) (i.e. *wherein the integrated circuit generates a control signal for a subscriber loop linefeed driver in response to the sensed signals*). As clearly illustrated in figure 1, the SLIC and SLAC are on separate substrates (i.e. *wherein the linefeed driver does not reside within a same integrated circuit*). Therefore, Zhou anticipates all limitations of the claim.

Claims 4 and 13 are essentially the same as claim 1 and are rejected for the same reasons.

Claim 2 is limited to *the integrated circuit package of claim 1*, as covered by Zhou. Zhou discloses that the sensed signals are taken across series coupled resistors, where the drop across each resistor is measured using an op-amp (column 4, lines 24-39). Voltage drop across a resistor is inherently proportional to the current through the resistor (i.e. *wherein the sensed tip signal includes first and second*

sampled tip voltage, wherein a difference between the first and second sampled tip voltages is proportional to the tip current, wherein the sensed ring signal includes first and second sampled ring voltage, wherein a difference between the first and second sampled ring voltages is proportional to the ring current). Therefore, Zhou anticipates all limitations of the claim.

Claims 6 and 17 are essentially the same as claim 2 and are rejected for the same reasons.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 3 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou.

Claim 3 is limited to *the integrated circuit package of claim 1*, as covered by Zhou. Zhou discloses digital circuitry that comprises a SLAC device (figure 1, element 12) where all inputs are digitized first. In addition, Zhou discloses that the SLAC is an integrated substrate (i.e. *integrated circuit*). However, Zhou does not disclose the logic family used in the manufacturing of the SLAC. The examiner takes Official Notice of the fact that CMOS was a well known logic family for digital fabrication at the time of the invention. It would have been obvious to one of ordinary skill in the art at the time of the

invention to implement the digital substrates of Zhou using the CMOS logic family because boasts good noise-margins and flexibility in design.

3. Claims 4-7, 10-13, 15-18, and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosch et al. (US Patent 5,274,702) in view of Zhou.

Claim 4 is limited to *a subscriber loop linefeed driver*. Rosch discloses a wideband telephone line interface circuit (abstract; figure 1). Figure 1 depicts the four main circuits and interfaces that comprise the subscriber circuit. Figures 2 and 3 provide detailed circuit and logic schematics of the various circuits and interfaces. Figure 2 depicts a resistor coupling network that provides not only balanced connection between the subscriber interface and the telephone line but also sensed loop (i.e. *TIP* and *RING*) signals, which is clearly indicated by the IL, ICM, and VCM outputs. Clearly depicted are current sensing feedbacks (46), one is associated with the voltage presented to the TIP terminal at line 36 and the other is associated with the voltage presented to the RING terminal at line 36 (i.e. *sense circuitry providing a sensed tip signal and a sensed ring signal*, and *wherein the sensed tip and ring signals correspond to a tip current and a ring current of the subscriber loop*). Figure 3 depicts the power feeding components of the telephone line interface circuit (column 10, lines 18-53). The circuitry comprising amplifiers 132 and 134 provides a DC current as well as AC current to the subscriber line by way of lines 36 (i.e. *and power circuitry for providing battery feed to a ring node and a tip node of a subscriber loop*). The input to the amplifier is *a control signal*. The DC current is digitally-controlled by control signals 154, 156, 162,

and 164. These signals are generated by digital control circuit 152 in accordance with signals IL, ICM, and VCM, which are clearly generated by the sensing circuitry, however (i.e. *in response to the sensed tip and ring signals*). However, Rosch makes no mention of what components to use in the construction of the line interface circuit. Several discrete parts are illustrated in the schematic, but their layout is unknown. Therefore, Rosch anticipates all limitations of the claim with the exception of providing sensed currents *to an integrated circuit*.

Zhou teaches a digital direct current feed control for a communications system (abstract; figure 1). As is clear form the illustration, the SLIC portion (14), which contains both current feed and current sensing elements, is situated on a high-voltage, analog substrate separate from the SLAC portion (12) – a low-voltage, digital substrate. Zhou's solution would have been ideal for the system of Rosch because they contain very similar topology. Zhou includes AC/DC coupling and sensing networks in the SLIC (column 3, line 59 to column 4, line 39). Rosch discloses analog AC/DC coupling in the line drive circuit (figure 1, element 10) and a sensing network (12). Furthermore, Zhou includes digital battery feed control circuitry (50; column 3, lines 1-4) as does Rosch (18; figure, element 152). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the line interface circuit of Rosch into two separate integrated substrates as taught by Zhou, and thus, separating the high-voltage and low-voltage components, which simplifies design, and allowing all digital circuitry to be inexpensively integrated together (i.e. placing the digital control circuitry of Rosch onto the digital substrate of the SLAC).

Claims 13 and 15 comprise limitations that are contained in the whole of claim 4, and thus, are rejected for the same reasons.

Claim 5 is limited to *the subscriber loop linefeed driver of claim 4*, as covered by Rosch in view of Zhou. Rosch discloses a resistor-based coupling network (44), which advantageously provides current sensing as a secondary function. Two current inputs to the amplifier are derived from the TIP and RING lines, the currents are drawn out by resistors 40, which are termination resistors (i.e. *a tip/ring resistor series-coupled to the tip/ring node and the power circuitry*) and resistors connected to other side of the termination resistors (i.e. *a pair of tip/ring sampling resistors one end of each tip/ring sampling resistor connected to opposite ends of the tip/ring resistor*). The inputs, or nodes, are denoted as 46 (i.e. *the other end of each tip/ring sampling resistor forming a tip/ring sense node*). Therefore, Rosch in view of Zhou makes obvious all limitations of the claim.

Claim 6 is limited to *the subscriber loop linefeed driver of claim 4*, as covered by Rosch in view of Zhou. As can be seen in figure 2, the currents upon lines 46 are summed together by resistors 64 and provided to node 68. Because both lines 46 contain parts of the TIP and RING currents, VCM, one of the TIP and RING signals provided to the integrated circuit, is formed of two sampled TIP/RING voltages. Because the sampled voltages are taken across termination resistors 40 the *difference between the first and second sampled tip voltages is* inherently *proportional to the tip/ring current*. Therefore, Rosch in view of Zhou makes obvious all limitations of the claim.

Claim 7 is limited to *the subscriber loop linefeed driver of claim 4*, as covered by Rosch in view of Zhou. As depicted in figure 3, Rosch discloses a TIP amplifier (132) (i.e. *a tip control circuit*) and a RING amplifier (134) (i.e. *a ring control circuit*). The amplifiers receive both DC and AC inputs at the positive input terminal. The amplifier acts as a buffer, therefore, its output is nearly an exact replica of its input. As the DC inputs (142, 144, 148, 150) are adjusted by the digital control circuit (152) by way of its control lines (154, 156, 162, 164) (i.e. *i.e. a first/second tip/ring control signal*) the voltage generated at the output of the buffer amplifiers is adjusted in the same way (column 11, lines 40-58). Therefore, Rosch in view of Zhou makes obvious all limitations of the claim.

Claim 10 is limited to *the subscriber loop linefeed driver of claim 4*, as covered by Rosch in view of Zhou. Rosch discloses receiving and transmitting AC signals (i.e. *further comprising voiceband circuitry for bi-directional communication of voiceband data between the ring and tip nodes and a voiceband data interface*). The circuitry is disclosed to some degree in figure 3. The connections labeled as Tx and Rx form part of the interface between the analog subscriber loop and the digital SLAC circuit that is not depicted in Rosch, but is referred to as a CODEC and DSP (column 6, lines 1-10). Also shown in figure 3 are amplifiers 104 and 106 that serve to couple received voice data to the subscriber loop as well as impedance 118, which provides an AC termination to incoming voice received from the subscriber loop. Furthermore, the voice signals are coupled to the subscriber loop by way of DC blocking capacitors (120, 136, and 138) (i.e. *wherein the voiceband circuitry provides the analog voiceband data*

interface with D.C. isolation from the ring and tip nodes). Therefore, Rosch in view of Zhou makes obvious all limitations of the claim.

Claim 11 is limited to *the subscriber loop linefeed driver of claim 10*, as covered by Rosch in view of Zhou. As shown in figure 3, the voice data is coupled to the subscriber loop by way of amplifiers 104 and 106 and impedance 118. The TX port can be considered *the input node*, the RX port *the output node*, and impedance 118 as the *load*. All elements are coupled by way of capacitors 120, 136, and 138 (i.e. *wherein the load and the first voiceband data input node are capacitively coupled to a selected one of the tip and ring nodes*). Therefore, Rosch in view of Zhou makes obvious all limitations of the claim.

Claim 12 is limited to *the subscriber loop linefeed driver of claim 4*, as covered by Rosch in view of Zhou. As shown in the rejections of claims 10 and 11, Rosch discloses voice interface circuitry in figure 3 (i.e. *further comprising voiceband circuitry for bi-directional communication of voiceband data between the ring and tip nodes and a voiceband data interface*). Particularly, the rejection of claim 11 characterizes the TX port as *a first voiceband data input node* that is connected to the subscriber loop by capacitors 136 and 138 (i.e. *capacitively coupled to a selected one of the ring and tip nodes for receiving voiceband data from the subscriber loop*). Furthermore, Rosch discloses coupling the AC signals and the DC signals to the subscriber loop using amplifiers 132 and 134. The input to the amplifiers is essentially a control signal (i.e. *wherein voiceband data transmitted to the subscriber loop is superimposed on the*

control signal). Therefore, Rosch in view of Zhou makes obvious all limitations of the claim.

Claims 16-18 and 21-23 are essentially the same as claims 5-7 and 10-12, respectively, and are rejected for the same reasons.

Allowable Subject Matter

4. **Claims 8, 9, 19, and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and following the filing of a terminal disclaimer to overcome all double-patenting rejections cited below.**

Claim 8 is limited to *the subscriber loop linefeed driver of claim 7*, as covered by Rosch in view of Zhou. Rosch discloses a DC power feed control circuit (figure 3). The circuitry includes digitally controlled current sources (144, 150) and analog, step-controlled current sources (142, 148). However, the detail of these current sources is unknown. The examiner asserts that it would have been obvious to one of ordinary skill in the art at the time of the invention to use transistors to implement the current sources, the schematic of Rosch does not suggest using transistors coupled in the common-base configuration suggested by the claim, such that the control voltages are presented at the emitter of the first and second transistors. Therefore, Rosch in view of Zhou makes obvious all limitations of the claim with the exception of *a first transistor of a first type*

having an emitter coupled to receive the first tip control signal. Thus, claim 8 would be allowable over the cited prior art after filing of a terminal disclaimer.

Claim 9 is allowable over Rosch in view of Zhou because it includes the same allowable subject matter described in claim 8.

Claims 19 and 20 are essentially the same as claims 8 and 9, respectively, and are allowable over Rosch in view of Zhou for the same reasons.

Double Patenting

The following forms the basis for all non-statutory obviousness-type double-patenting rejections set forth in this Office action:

> The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).
>
> A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).
>
> Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1, 2, 4-9, 13, and 15-20 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 14 and 20 in view of the supporting portions of the specification of copending Application No. 09/608,743. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Application '743 discloses in claims 14 and 20 circuitry that is also recited, verbatim, in claims 7-9 and 18-20. The only difference between claims 14 and 20 of '743 and the current application is that claims 7-9 and 18-20 include limitations from their parent claims 4, 13, and 15 directed towards sensing circuitry that supplies sensed signals to control circuitry, which is responsible for the control of the power circuitry in response to the sensed signals (see claims 4, 13, and 15 of current application). Therefore, claims 14 and 20 of '743 anticipate all limitations of claims 4, 7-9, 13, 15, and 18-20 of the current application with the exception of *sense circuitry*.

Because the claims of '743 include receiving control signals (see claims 13 and 19, *first/second tip control signal*) to assist in automatic operation of the tip and ring control circuits the origin of these control signals must be relevant to the invention claimed therein. Henceforth, the portion of the '743 specification relating to control of the tip and ring control circuit must be included in determining the patentability of the limitations presented in claims 4, 13, and 15 of the current application.

Page 11, lines 9-13 indicate that the linefeed control signals are generated by a signal processor 210, the processor generates the control signals in response to sensed parameters of both a tip and ring line. Furthermore, the sensed tip and ring line parameters are generated by way of sensing resistors RS1, RS2, RS3, and RS4, all shown in figure 4. Therefore, the specification provides evidence requiring the sensing circuitry claimed in claims 4, 7-9, 13, 15, and 18-20 of the current application. It would have been obvious to one of ordinary skill in the art at the time of the invention to include the tip and ring sense circuitry as claimed in claims 4, 7-9, 13, 15, and 18-20

because application '743 states that the control signals used by the tip and ring control circuitry are received from a signal processor in response to sensed tip and ring parameters, and the combination of sense circuitry with the first circuit of '743 is necessary even for the '743 invention to work.

Claims 13, 15, and 18-20 also include the limitation *wherein an integrated circuit generates the loop control signals in response to a sensed tip signal and a sensed ring signal of the subscriber loop.* The claims of '743 do not include this limitation, but the specification of '743 (page 13, lines 2-7) suggests that the signal processing occurs on a low-voltage integrated circuit. Again, reliance on this part of the disclosure is necessitated by the fact that claims 14 and 20 include tip and ring control signals. It would have been obvious to incorporate the signal processor onto a low-voltage integrated circuit for the purpose of reducing size and manufacturing cost of the signal processing components.

In addition to claims 4, 7-9, 13, 15, and 18-20 of the current application, claims 14 and 20 of application '743 in view of the specification of '743 also make obvious the limitations of claims 5, 6, 16, and 17 of the current application. Claims 5 and 6 are directed toward the structure of the sensing circuitry, which is identical to the sensing structure shown in figure 4 of '743, and which has been incorporated by the double-patenting rejection of claims 4 and 13 rendering these claims obvious. Claims 16 and 17 are essentially the same as claims 5 and 6, and thus, are rejected for the same reasons.

Claims 1 and 2 are unpatentable over claim 15 of the current application, and thus are unpatentable over claim 20 of '743 in view of the specification of '743.

Response to Arguments

In order to expedite and clarify prosecution on the merits, new grounds of rejection are hereby presented.

6. **Applicant's arguments with respect to claims 1-23, filed in paper 19 on 09 June 2004, have been considered but are moot in view of the new ground(s) of rejection.**

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F Briney III whose telephone number is 703-305-0347. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WFB
9/1/04

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